

**UNITED STATES DISTRICT COURT  
DISTRICT OF MINNESOTA**

STRATASYS INC.,  Plaintiff,  v.  MICROBOARDS TECHNOLOGY, LLC d/b/a AFINIA,  Defendant.	Civ. No. 0:13-cv-03228 DWF-HB  <b>JOINT CLAIM CONSTRUCTION STATEMENT</b>
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Pursuant to the Pretrial Scheduling Order dated February 19, 2014 (Dkt. No. 26), as amended on July 25, 2014 (Dkt. No. 64), Stratasys, Inc. (“Stratasys”) and Microboards Technology, LLC d/b/a Afinia (“Afinia”) hereby submit this Joint Claim Construction Statement (“Statement”).

This Statement identifies the claim terms and phrases that one or both of the parties believes require construction. For each of the disputed claim terms and phrases, the Statement identifies the party or parties requesting construction, provides the claim construction position of each party, and identifies intrinsic evidence and any known extrinsic evidence on which either party may rely either to support its proposed construction or to oppose the other party’s construction. Each party reserves the right to rely on any intrinsic evidence or extrinsic evidence cited by the other party in this Statement.

**Stratasys's Position on a Claim Construction Hearing:** Stratasys requests that the Court schedule a claim construction hearing. Stratasys believes that both the Court and parties will benefit from the live dialog and context available at a hearing in which the parties may present their arguments and also answer any factual or legal questions that the parties may not have anticipated in the briefing for each specific term. Furthermore, a hearing will provide the parties with an opportunity to address the arguments from the other side's responsive brief on each specified term. In addition, fact discovery is currently scheduled to close on February 27, 2015, and initial expert reports are currently due on March 31, 2015. Stratasys believes that a claim construction hearing and ruling will be helpful for expert discovery.

Stratasys anticipates that the claim construction hearing will require approximately 2-4 hours. Stratasys proposes that the claim construction hearing be conducted on a term-by-term basis that allows each side to address each disputed claim term before moving on to a different claim term. Stratasys reserves the right to call live witnesses at the hearing, or in the alternative, to present witness testimony by affidavit or deposition testimony, and in accordance with the Pretrial Scheduling Order, attaches hereto as Exhibit 1 the expert declaration of Stephen C. Danforth, Ph.D. Stratasys notes that Afinia has not disclosed the substance of any proposed expert testimony, as required by the Pretrial Scheduling Order. Stratasys therefore reserves the right to exclude any expert testimony offered by Afinia. In the event Afinia discloses expert testimony, Stratasys reserves the right to take the deposition of any expert witness and to also provide additional expert testimony in rebuttal to any expert testimony offered by Afinia.

Stratasys requests that the Court set a briefing schedule. Stratasys proposes that the parties simultaneously file and serve their opening and responsive claim construction briefs. Each side's total briefing (opening and responsive briefs combined) shall not exceed 12,000 words per Local Rule 7.1(d).

**Afinia's Position on a Claim Construction Hearing:** Afinia requests that the Claim Construction briefing and hearing be scheduled after a decision by the Court whether to preliminarily stay this proceeding in light of the Inter Parties Review Petitions filed at the United States Patent Office. Briefly, on November 21, 2014, Afinia filed Inter Partes Review Petitions pursuant to 35 U.S.C. § 311 et seq. for each of the asserted patents. Those petitions have been accorded a verified filing date.

The Defendant has proposed a stay in this action to Plaintiff in an effort to save judicial and party resources. The parties are scheduled to have an additional meet and confer on Friday, December 18, 2014, to discuss Defendant's intention to move for a preliminary stay and a proposed briefing schedule for such a motion. Stratasys has stated that it intends to oppose a motion for a stay.

In the event that Defendant's motion for preliminary stay is not granted, Afinia agrees that the Court and parties will benefit from a claim construction hearing. Afinia agrees that such a hearing will require approximately 2-4 hours. Afinia proposes that the claim construction hearing be conducted on a patent-by-patent basis that permits the Court to simultaneously consider related terms.

Afinia notes that federal court precedent disfavors the use of extrinsic evidence in claim constructions. Thus, Afinia reserves the right to object to Stratasys' extrinsic

evidence. Afinia also reserves the right to call live witnesses at the hearing, or received in the alternative, to present witness testimony by affidavit or deposition testimony, and in accordance with the Pretrial Scheduling Order in rebuttal to the expert report of Dr. Stephen C. Danforth, Ph.D, and requests forty five days to provide a rebuttal report once Plaintiff's expert report is served. Afinia identifies Dr. Thomas Campbell, Ph.D. and/or Dr. Thomas Kurfess, Ph.D., as potentially offering expert testimony in rebuttal to Plaintiff's expert opinions. Afinia's reserves the right to depose Dr. Stephen C. Danforth concerning any opinions offered for the Claim Construction proceedings.

Afinia also requests that the Court set a briefing schedule. Afinia agrees with Stratasys's proposal that the parties simultaneously file and serve their opening and responsive claim construction briefs. Each side's total briefing (opening and responsive briefs combined) shall not exceed 12,000 words per Local Rule 7.1(d).

**The Parties' Respective Claim Constructions  
and Intrinsic and Extrinsic Evidence in Support**

**A. Claim Terms, Phrases, and Clauses For Which the Parties Agree on a Construction.**

The parties have met and conferred in an effort to reach agreement on the meaning of the disputed claim terms, and have reached an agreement on the construction of the following claim terms:

**'058 Patent Claim Terms**

- 1) "creep relaxation temperature": "temperature at which the stress relaxation modulus has dropped by a factor of 10 from its low temperature limit (indicating that it is sufficiently solid that modeling can occur)"
- 2) "local region": "the vicinity of the newly deposited material"

**'124 Patent Claim Terms**

3) “exterior to the heating block”: plain and ordinary meaning

**'239 Patent Claim Terms**

4) “oriented at a non-right angle”: “the orientation is at an angle that is not ninety degrees”

**B. Claim Terms, Phrases, and Clauses For Which the Parties Do Not Agree on a Construction.**

The parties offer their respective positions on the construction of the claim terms still in dispute below.

**Claim Terms from the '058 Patent**

**1. “build region” as used in claim 1  
(identified for construction by Afinia)**

<b>Stratasys’s Proposed Construction and Evidence</b>	<b>Afinia’s Proposed Construction and Evidence</b>
<p><b>Plain and ordinary meaning.</b></p> <p>If this term needs construction, Stratasys’s proposed construction is:</p> <p><b>“volume of space in which an object can be built”</b></p> <p><i>Intrinsic Evidence:</i></p> <p>U.S. Patent 5866,058, including but not limited to:</p> <ul style="list-style-type: none"> <li>-Claim 1</li> <li>-Abstract</li> <li>-Figure 4</li> <li>-1:42-45</li> </ul>	<p><b>“a heated build environment in which the temperature gradient is stable from the top layer (in the z-direction) relative to the bottom layer”</b></p> <p><i>Intrinsic Evidence:</i></p> <p>U.S. Patent No. 5,866,058, including but not limited to:</p> <p>The ‘058 Patent introduces the concept of a build region as a heated build environment as a technique to reduce curl:</p> <p>Techniques exist to reduce the impact of curl. One technique involves the heating of the ambient build environment to reduce</p>

Stratasys's Proposed Construction and Evidence	Afinia's Proposed Construction and Evidence
<p>-2:49-61 -3:10-19 -5:36-47</p> <p>U.S. Patent 5,866,058 prosecution history, including references cited (e.g., U.S. Patent 5,121,329, U.S. Patent 4,749,347, U.S. Patent 5,141,680)</p> <p><i>Extrinsic Evidence:</i></p> <p>Stratasys is relying on the expert opinion of Stephen Danforth, Ph.D., attached as Exhibit 1, relating to how and why a person of ordinary skill in the art would have understood “build region” to have its plain and ordinary meaning or to mean “volume of space in which an object can be built” in the context of the '058 patent.</p> <p>Stratasys reserves the right to rely on the claim construction proposed and any statements made by Afinia in the IPR proceedings on the '058 patent (IPR2015-00284).</p>	<p>the possible temperature differences. Another technique is to carefully choose build materials which exhibit lowest possible thermal expansion coefficients. Yet another technique is to deposit the build material at the lowest possible temperature. Importantly, in the '058 Patent, the applicants describe the problems of not heating the build environment, resulting in a temperature gradient from the top layer (in the z-direction) relative to the bottom layer that causes curl:</p> <p>Sequential layers of a thermoplastic material 104 are deposited on a base 102 using a moving extruder 106. As is typical in thermally solidified rapid prototypes, a series of layers are deposited sequentially in the z direction (i.e., the direction orthogonal to base 102), with the last layer deposited always having the highest temperature. Such an additive process typically results in a geometrically accurate part which contains a thermal gradient. As the part subsequently cools and becomes isothermal, the part distorts as a result of a curling of the ends of long features. Col. 2, lns. 24-30.</p> <p>A heated flowable modeling material is then sequentially extruded at its deposition temperature into a build environment that maintains the volume in the vicinity of the newly deposited material in a deposition temperature window between the material's solidification temperature and its creep temperature.</p> <p>Col. 3, lns. 10–15.</p>

Stratasys's Proposed Construction and Evidence	Afinia's Proposed Construction and Evidence
	<p>a build environment that maintains the build volume in the vicinity of the newly deposited material in a deposition temperature window defined by the material's solidification temperature and it's creep temperature (box 112).</p> <p>Col. 5, lns 38-42.</p> <p>U.S. Patent 5,866,058 prosecution history, including references cited</p> <p><i>Extrinsic Evidence:</i></p> <p>Afinia identifies Dr. Thomas Campbell, Ph.D. and/or Dr. Thomas Kurfess, Ph.D., as potentially offering expert testimony in rebuttal to Plaintiff's expert opinions.</p>

**2. "local region temperature" as used in claim 1  
(identified for construction by Afinia)**

Stratasys's Proposed Construction and Evidence	Afinia's Proposed Construction and Evidence
<p><b>"temperature in the vicinity of the newly deposited material"</b></p> <p><i>Intrinsic Evidence:</i></p> <p>U.S. Patent 5,866,058, including but not limited to:</p> <ul style="list-style-type: none"> <li>-Claim 1</li> <li>-Claim 5</li> <li>-Abstract</li> <li>-3:10-15</li> </ul>	<p><b>"at least in the vicinity of where newly deposited material will be applied, the previously deposited material must be maintained at a temperature that is preferably in a range between the material's solidification temperature and its creep relaxation temperature"</b></p> <p><i>Intrinsic Evidence:</i></p> <p>U.S. Patent No. 5,866,058, including but</p>

Stratasys's Proposed Construction and Evidence	Afinia's Proposed Construction and Evidence
<p>-4:60-65 -5:1-5 -5:15-19 -5:36-43</p> <p>U.S. Patent 5,866,058 prosecution history, including references cited (e.g., U.S. Patent 5,121,329, U.S. Patent 4,749,347, U.S. Patent 5,141,680)</p> <p><i>Extrinsic Evidence:</i></p> <p>Stratasys is relying on the expert opinion of Stephen Danforth, Ph.D., attached as Exhibit 1, relating to how and why a person of ordinary skill in the art would have understood “local region temperature” to mean “temperature in the vicinity of the newly deposited material” in the context of the ’058 patent.</p> <p>Stratasys reserves the right to rely on the claim construction proposed and any statements made by Afinia in the IPR proceedings on the ’058 patent (IPR2015-00284).</p>	<p>not limited to:</p> <p>The ‘058 Patent describes the concept of local region temperature as follows:</p> <p>It has been determined that by maintaining a previously deposited material (in a rapid prototyping system utilizing thermal solidification) within a specific temperature window, that stresses present in the deposited material are relieved and geometric distortions reduced. At least in the vicinity of where newly deposited material will be applied, the previously deposited material must be maintained at a temperature that is preferably in a range between the material's solidification temperature and its creep relaxation temperature. Col. 2, lns. 56-65.</p> <p>U.S. Patent 5,866,058 prosecution history, including references cited</p> <p><i>Extrinsic Evidence:</i></p> <p>Afinia identifies Dr. Thomas Campbell, Ph.D. and/or Dr. Thomas Kurfess, Ph.D., as potentially offering expert testimony in rebuttal to Plaintiff's expert opinions.</p>

**3. “solidification temperature” as used in claim 1  
(identified for construction by both parties)**

Stratasys's Proposed Construction and Evidence	Afinia's Proposed Construction and Evidence
“temperature at which the material behaves as a solid”	“a temperature at which the material may be considered to be solid at which



<b>Stratasys's Proposed Construction and Evidence</b>	<b>Afinia's Proposed Construction and Evidence</b>
<p><i>Intrinsic Evidence:</i></p> <p>U.S. Patent 5,866,058, including but not limited to:</p> <ul style="list-style-type: none"> <li>-Claim 1</li> <li>-Abstract</li> <li>-Figure 3A</li> <li>-Figure 3B</li> <li>-Figure 3C</li> <li>-Figure 4</li> <li>-3:66-4:39</li> <li>-5:36-47</li> </ul> <p>U.S. Patent 5,866,058 prosecution history, including references cited (e.g., U.S. Patent 5,121,329, U.S. Patent 4,749,347, U.S. Patent 5,141,680)</p> <p><i>Extrinsic Evidence:</i></p> <p>Stratasys is relying on the expert opinion of Stephen Danforth, Ph.D., attached as Exhibit 1, relating to how and why a person of ordinary skill in the art would have understood "solidification temperature" to mean "temperature at which the material behaves as a solid" in the context of the '058 patent.</p> <p>Stratasys reserves the right to rely on the claim construction proposed and any statements made by Afinia in the IPR proceedings on the '058 patent (IPR2015-00284).</p>	<p><b>there is very little creep"</b></p> <p><i>Intrinsic Evidence:</i></p> <p>U.S. Patent No. 5,866,058, including but not limited to:</p> <p>The '058 Patent defines that temperature as the point at which there is "very little creep." Col. 4, lns. 31-32:</p> <p>"FIG. 3B shows that ABS has very little creep over 300 seconds, for temperatures up to about 70° C. This temperature is defined as the solidification temperature."</p> <p>U.S. Patent 5,866,058 prosecution history, including references cited</p> <p><i>Extrinsic Evidence:</i></p> <p>Afinia identifies Dr. Thomas Campbell, Ph.D. and/or Dr. Thomas Kurfess, Ph.D., as potentially offering expert testimony in rebuttal to Plaintiff's expert opinions.</p>

**4. “thermally solidifiable material” as used in claim 1  
(identified for construction by both parties)**

Stratasys’s Proposed Construction and Evidence	Afinia’s Proposed Construction and Evidence
<p><b>Plain and ordinary meaning.</b></p> <p>If this term needs construction, Stratasys’s proposed construction is:</p> <p><b>“a material that can undergo a state change, from behaving as a fluid to behaving as a solid”</b></p> <p><i>Intrinsic Evidence:</i></p> <p>U.S. Patent 5,866,058, including but not limited to:</p> <ul style="list-style-type: none"> <li>-Claim 1</li> <li>-Figure 3A</li> <li>-Figure 3B</li> <li>-Figure 3C</li> <li>-3:6-19</li> <li>-3:66-4:45</li> <li>-5:34-36</li> </ul> <p>U.S. Patent 5,866,058 prosecution history, including references cited (e.g., U.S. Patent 5,121,329, U.S. Patent 4,749,347, U.S. Patent 5,141,680)</p> <p><i>Extrinsic Evidence:</i></p> <p>Stratasys is relying on the expert opinion of Stephen Danforth, Ph.D., attached as Exhibit 1, relating to how and why a person of ordinary skill in the art would have understood “thermally solidifiable material” have its plain and ordinary meaning or to mean “a material that can</p>	<p><b>“a thermally solidifiable material is a material that undergoes a state change, from a fluid to a solid, according to temperature”</b></p> <p><i>Intrinsic Evidence:</i></p> <p>U.S. Patent No. 5,866,058, including but not limited to:</p> <p>The ‘058 Patent describes various thermoplastics, including as a primary example, an ABS thermoplastic:</p> <p>This invention is based on the recognition that there is a transition region between a material's fluid state and it’s solid state. How broad a temperature range that encompasses the transition region varies with the type of material being extruded. Crystalline materials will tend to have sharper transition regions, while glassy materials will exhibit broader transition regions. However, crystalline materials in the solid phase have temperature-dependent creep rates that increase markedly as the melting point of the material is approached. Hereafter, the description will primarily consider the characteristics of glassy thermoplastics, however, the invention is also applicable to mixed phase and crystalline materials. Col. 3, ln. 66-col. 4, ln. 11.</p> <p>U.S. Patent 5,866,058 prosecution history, including references cited</p>

Stratasys's Proposed Construction and Evidence	Afinia's Proposed Construction and Evidence
<p>undergo a state change, from behaving as a fluid to behaving as a solid" in the context of the '058 patent.</p> <p>Stratasys reserves the right to rely on the claim construction proposed and any statements made by Afinia in the IPR proceedings on the '058 patent (IPR2015-00284).</p>	<p><i>Extrinsic Evidence:</i></p> <p>Afinia identifies Dr. Thomas Campbell, Ph.D. and/or Dr. Thomas Kurfess, Ph.D., as potentially offering expert testimony in rebuttal to Plaintiff's expert opinions.</p>

**5. "cooling" as used in claim 1  
(identified for construction by Afinia)**

Stratasys's Proposed Construction and Evidence	Afinia's Proposed Construction and Evidence
<p><b>Plain and ordinary meaning.</b></p> <p><i>Intrinsic Evidence:</i></p> <p>U.S. Patent 5,866,058, including but not limited to:</p> <ul style="list-style-type: none"> <li>-Claim 1</li> <li>-1:45-46</li> <li>-2:8-10</li> </ul> <p>U.S. Patent 5,866,058 prosecution history, including references cited (e.g., U.S. Patent 5,121,329, U.S. Patent 4,749,347, U.S. Patent 5,141,680)</p> <p><i>Extrinsic Evidence:</i></p> <p>Stratasys is relying on the expert opinion of Stephen Danforth, Ph.D., attached as Exhibit 1, relating to how and why a person of ordinary skill in the art would have</p>	<p><b>"reducing temperature at a rate (dT) that does not violate the equation: <math>(dT/dz)_{max}=8\delta/L^2a</math>"</b></p> <p><i>Intrinsic Evidence:</i></p> <p>U.S. Patent No. 5,866,058, including but not limited to:</p> <p>The '058 Patent sets forth an equation representing the acceptable thermal gradient (see <math>(dT/dz)_{max}=8\delta/L^2a</math>) (Eq. 2). Col. 2, ln.16. The '058 Patent further states:</p> <p>Once the entire prototype model has been completed, it needs to be cooled so that it is everywhere below the material's solidification temperature, before it is handled or significantly stressed. The cooling rate should be slow enough that the</p>

<p>understood “cooling” to have its plain and ordinary meaning in the context of the ’058 patent.</p> <p>Stratasys reserves the right to rely on the claim construction proposed and any statements made by Afinia in the IPR proceedings on the ’058 patent (IPR2015-00284).</p>	<p>thermal gradient limit set by equation 2 is not violated. Col. 5, Ins. 24-30.</p> <p>U.S. Patent 5,866,058 prosecution history, including references cited</p> <p><i>Extrinsic Evidence:</i> Afinia identifies Dr. Thomas Campbell, Ph.D. and/or Dr. Thomas Kurfess, Ph.D., as potentially offering expert testimony in rebuttal to Plaintiff’s expert opinions.</p>
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### **Claim Terms from the ’124 Patent**

**6. “thin-wall tube” as used in claims 1 and 17  
(identified for construction by both parties)**

<b>Stratasys’s Proposed Construction and Evidence</b>	<b>Afinia’s Proposed Construction and Evidence</b>
<p><b>“a single piece of tubing with wall thickness that allows the tubing to act as a cap zone and a heating zone”</b></p> <p>The term “thin-wall tube” is a single phrase that should be construed as such. Accordingly, Stratasys does not agree that “thin wall” and “thin-wall tube” should be construed separately, as Afinia proposes.</p> <p><i>Intrinsic Evidence:</i></p> <p>U.S. Patent 6,004,124, including but not limited to:</p> <ul style="list-style-type: none"> <li>-Claim 1</li> <li>-Claim 7</li> <li>-Claim 15</li> <li>-Claim 17</li> <li>-Claim 23</li> <li>-Claim 31</li> <li>-Abstract</li> </ul>	<p><b>“a single piece of tubing with a wall thickness on the order of 0.005-0.015 inches, and with an inlet end associated with a cap zone and an outlet end associated with a heating zone, the inlet end of the tube extending at least partially exterior to the heating block.</b></p> <p><i>Intrinsic Evidence:</i></p> <p>U.S. Patent No. 6,004,124, including but not limited to:</p> <p>The ’124 Patent notes, “The present invention provides a thin-tube liquefier formed of a single piece of thin-wall tubing encased in a heating block. The tube acts as both the heating zone and the cap zone of the liquifier.” Col. 2, Ins. 64-67.</p> <p>The specification states, “As shown in FIG. 9, thin-wall tube 212 has an inlet end 224,</p>

<p>-Figure 8          -Figure 9          -1:29-2:54          -2:64-67          -3:7-13          -3:18-26          -7:50-57          -11:8-31          -11:34-42          -12:52-67</p> <p>U.S. Patent 6,004,124 prosecution history, including references cited (e.g., U.S. Patent 5,340,433 and U.S. Patent 5,121,329)</p> <p><i>Extrinsic Evidence:</i></p> <p>Stratasys is relying on the expert opinion of Stephen Danforth, Ph.D., attached as Exhibit 1, relating to how and why a person of ordinary skill in the art would have understood “thin-wall tube” to mean “a single piece of tubing with wall thickness that allows the tubing to act as a cap zone and a heating zone” in the context of the ’124 patent.</p> <p>Stratasys reserves the right to rely on the claim construction proposed and any statements made by Afinia in the IPR proceedings on the ’124 patent (IPR2015-00287).</p>	<p>an outlet end 226 and is bent at a 90° angle.”</p> <p>“A first section of the tube adjacent the inlet end functions as the entrance or cap zone. This first section of the tube is exterior to the heating block.”</p> <p>It will be understood that the claim term “tube” is further modified by the “thin wall” aspect such that it complies with dimensional range from (1), above.</p> <p>U.S. Patent 6,004,124 prosecution history, including references cited</p> <p><i>Extrinsic Evidence:</i></p> <p>Afinia identifies Dr. Thomas Campbell, Ph.D. and/or Dr. Thomas Kurfess, Ph.D., as potentially offering expert testimony in rebuttal to Plaintiff’s expert opinions.</p>
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**Claim Terms from the '239 Patent****7. “generating” as used in claims 1 and 15  
(identified for construction by Afinia)**

<b>Stratasys’s Proposed Construction and Evidence</b>	<b>Afinia’s Proposed Construction and Evidence</b>
<p><b>Plain and ordinary meaning.</b></p> <p><i>Intrinsic Evidence:</i></p> <p>U.S. Patent 8,349,239, including but not limited to:</p> <ul style="list-style-type: none"> <li>-Claim 1</li> <li>-Claim 15</li> <li>-1:53-58</li> <li>-4:65-5:4</li> <li>-11:10-20</li> </ul> <p>U.S. Patent 8,349,239 prosecution history, including references cited</p> <p><i>Extrinsic Evidence:</i></p> <p>U.S. Patent Pub. No. 2003/0236588</p> <p>Stratasys is relying on the expert opinion of Stephen Danforth, Ph.D., attached as Exhibit 1, relating to how and why a person of ordinary skill in the art would have understood “generating” to have its plain and ordinary meaning in the context of the ’239 patent.</p> <p>Stratasys reserves the right to rely on the claim construction proposed and any statements made by Afinia in the IPR proceedings on the ’239 patent (IPR2015-00288).</p>	<p><b>“created by a computer”</b></p> <p><i>Intrinsic Evidence:</i></p> <p>U.S. Patent No. 8,349,239, including but not limited to:</p> <p>For each layer, computer <b>12</b> may then generate one or more tool paths for extrusion head to follow for building each layer of 3D model <b>26</b> and support structure <b>28</b>. Col. 4, ln 65 – Col. 5, ln. 1.</p> <p>U.S. Patent 8,349,239 prosecution history, including references cited</p> <p><i>Extrinsic Evidence:</i></p> <p>Afinia identifies Dr. Thomas Campbell, Ph.D. and/or Dr. Thomas Kurfess, Ph.D., as potentially offering expert testimony in rebuttal to Plaintiff’s expert opinions.</p>

**8. “contour tool path” as used in claims 1 and 15  
(identified for construction by Afinia)**

Stratasys’s Proposed Construction and Evidence	Afinia’s Proposed Construction and Evidence
<p><b>“an extrusion head path which defines a perimeter of a layer of a three-dimensional object”</b></p> <p><i>Intrinsic Evidence:</i></p> <p>U.S. Patent 8,349,239, including but not limited to:</p> <ul style="list-style-type: none"> <li>-Claim 1</li> <li>-Claim 15</li> <li>-Abstract</li> <li>-1:17-19</li> <li>-1:53-58</li> <li>-4:64-5:10</li> <li>-6:1-3</li> <li>-8:32-38</li> <li>-9:6-15</li> <li>-10:8-18</li> <li>-10:23-28</li> </ul> <p>U.S. Patent 8,349,239 prosecution history, including references cited</p> <p><i>Extrinsic Evidence:</i></p> <p>U.S. Patent Pub. No. 2003/0236588</p> <p>Stratasys is relying on the expert opinion of Stephen Danforth, Ph.D., attached as Exhibit 1, relating to how and why a person of ordinary skill in the art would have understood “contour tool path” to have mean “an extrusion head path which defines a perimeter of a layer of a three-</p>	<p><b>“a tool path that defines a perimeter of a 3D model for the given layer. It will be understood that the layer may have more than one perimeter, such as for an internal feature”</b></p> <p><i>Intrinsic Evidence:</i></p> <p>U.S. Patent No. 8,349,239, including but not limited to:</p> <p>As noted in the specification of the ‘239 Patent, “the generation of the tool path(s) for a layer of 3D model 26 may initially involve generating one or more contour tool paths that define the perimeter(s) of 3D model 26 for the given layer. Col. 5, lns. 1-4.</p> <p>U.S. Patent 8,349,239 prosecution history, including references cited</p> <p><i>Extrinsic Evidence:</i></p> <p>Afinia identifies Dr. Thomas Campbell, Ph.D. and/or Dr. Thomas Kurfess, Ph.D., as potentially offering expert testimony in rebuttal to Plaintiff’s expert opinions.</p>

Stratasys's Proposed Construction and Evidence	Afinia's Proposed Construction and Evidence
<p>dimensional object" in the context of the '239 patent.</p> <p>Stratasys reserves the right to rely on the claim construction proposed and any statements made by Afinia in the IPR proceedings on the '239 patent (IPR2015-00288).</p>	

**9. "interior region of a layer"/"interior region of the layer" as used in claims 1, 15 (identified for construction by Afinia)**

Stratasys's Proposed Construction and Evidence	Afinia's Proposed Construction and Evidence
<p><b>Plain and ordinary meaning.</b></p> <p>If this term needs construction, Stratasys's proposed construction is:</p> <p><b>"an area defined by a perimeter of the layer"</b></p> <p><i>Intrinsic Evidence:</i></p> <p>U.S. Patent 8,349,239, including but not limited to:</p> <ul style="list-style-type: none"> <li>-Claim 1</li> <li>-Claim 15</li> <li>-Figure 14</li> <li>-Figure 15</li> <li>-Abstract</li> <li>1:63-2:2</li> <li>-2:8-11</li> <li>-5:11-19</li> <li>-6:5-16</li> </ul>	<p><b>"interior region": "an area within a perimeter defined by a contour tool path"</b></p> <p><i>Intrinsic Evidence:</i></p> <p>U.S. Patent No. 8,349,239, including but not limited to:</p> <p>The generation of the tool path(s) for a layer of 3D model 26 may initially involve generating one or more contour tool paths that define the perimeter(s) of 3D model <b>26</b> for the given layer. As discussed below, computer <b>12</b> also desirably adjusts the start point and/or the stop point of each contour tool path of the layer to one or more locations that are within an interior region of the layer defined by the respective contour tool path. This effectively conceals the seam that is formed at the intersection of the start and stop points. Based on each</p>



Stratasys's Proposed Construction and Evidence	Afinia's Proposed Construction and Evidence
<p>-7:3-16 -12:10-14</p> <p>U.S. Patent 8,349,239 prosecution history, including references cited</p> <p><i>Extrinsic Evidence:</i></p> <p>U.S. Patent Pub. No. 2003/0236588</p> <p>Stratasys is relying on the expert opinion of Stephen Danforth, Ph.D., attached as Exhibit 1, relating to how and why a person of ordinary skill in the art would have understood “interior region of a layer”/“inter region of the layer” to have its plain and ordinary meaning or to mean “an area defined by a perimeter of the layer” in the context of the '239 patent.</p> <p>Stratasys reserves the right to rely on the claim construction proposed and any statements made by Afinia in the IPR proceedings on the '239 patent (IPR2015-00288).</p>	<p>generated contour tool path, computer <b>12</b> may then generate one or more additional tool paths (e.g., raster paths) to fill in the interior region(s) defined by the perimeter(s), as necessary. As further discussed below, the generation of the additional tool path(s) (e.g., raster paths) desirably compensate for the adjustments in the locations of the start points and/or the stop points of the contour tool path(s). Col. 5, lns. 1-19.</p> <p>U.S. Patent 8,349,239 prosecution history, including references cited</p> <p><i>Extrinsic Evidence:</i></p> <p>Afinia identifies Dr. Thomas Campbell, Ph.D. and/or Dr. Thomas Kurfess, Ph.D., as potentially offering expert testimony in rebuttal to Plaintiff's expert opinions.</p>

**10. “start point” as used in claims 1 and 15  
(identified for construction by Afinia)**

Stratasys's Proposed Construction and Evidence	Afinia's Proposed Construction and Evidence
<p><b>Claim 1: “point where the contour tool path begins”</b></p> <p><b>Claim 15: “point where the tool path begins”</b></p>	<p><b>“a tool path instruction for initiating extrusion of modeling material”</b></p> <p><i>Intrinsic Evidence:</i></p> <p>U.S. Patent No. 8,349,239, including but</p>

<b>Stratasys's Proposed Construction and Evidence</b>	<b>Afinia's Proposed Construction and Evidence</b>
<p><i>Intrinsic Evidence:</i></p> <p>U.S. Patent 8,349,239, including but not limited to:</p> <ul style="list-style-type: none"> <li>-Claim 1</li> <li>-Claim 15</li> <li>-Figure 3</li> <li>-Figure 14</li> <li>-Figure 15</li> <li>-1:53-58</li> <li>-5:4-8</li> <li>-6:17-7:22</li> <li>-7:35-37</li> <li>-9:6-11</li> <li>-10:26-28</li> <li>-12:22-25</li> </ul> <p>U.S. Patent 8,349,239 prosecution history, including references cited</p> <p><i>Extrinsic Evidence:</i></p> <p>U.S. Patent Pub. No. 2003/0236588</p> <p>Stratasys is relying on the expert opinion of Stephen Danforth, Ph.D., attached as Exhibit 1, relating to how and why a person of ordinary skill in the art would have understood "start point" to mean "point where the contour tool path begins" in claim 1 and to mean "point where the tool path begins" in claim 15 in the context of the '239 patent.</p> <p>Stratasys reserves the right to rely on the claim construction proposed and any statements made by Afinia in the IPR proceedings on the '239 patent (IPR2015-</p>	<p>not limited to:</p> <p>The '239 patent states that "as discussed below, computer <b>12</b> also desirably adjusts the start point and/or the stop point of each contour tool path of the layer to one or more locations that are within an interior region of the layer defined by the respective contour tool path." Col. 5, lns. 4-8.</p> <p>The '239 patent further states that "start point <b>52</b> is a first location in the x-y plane at which extrusion head <b>20</b> is directed to begin depositing the modeling material." Col. 6, lns. 18-20.</p> <p>U.S. Patent 8,349,239 prosecution history, including references cited</p> <p><i>Extrinsic Evidence:</i></p> <p>Afinia identifies Dr. Thomas Campbell, Ph.D. and/or Dr. Thomas Kurfess, Ph.D., as potentially offering expert testimony in rebuttal to Plaintiff's expert opinions.</p>

Stratasys's Proposed Construction and Evidence	Afinia's Proposed Construction and Evidence
00288).	

**11. "stop point" as used in claim 1 and 15  
(identified for construction by Afinia)**

Stratasys's Proposed Construction and Evidence	Afinia's Proposed Construction and Evidence
<p><b>Claim 1: "point where the contour tool path ends"</b></p> <p><b>Claim 15: "point where the tool path ends"</b></p> <p><i>Intrinsic Evidence:</i></p> <p>U.S. Patent 8,349,239, including but not limited to:</p> <ul style="list-style-type: none"> <li>-Claim 1</li> <li>-Claim 15</li> <li>-Figure 3</li> <li>-Figure 14</li> <li>-Figure 15</li> <li>-1:53-58</li> <li>-5:4-8</li> <li>-6:17-7:22</li> <li>-7:35-37</li> <li>-10:26-28</li> <li>-12:22-25</li> </ul> <p>U.S. Patent 8,349,239 prosecution history, including references cited</p> <p><i>Extrinsic Evidence:</i></p> <p>U.S. Patent Pub. No. 2003/0236588</p>	<p><b>"a tool path instruction for terminating modeling material extrusion that began and proceeded continuously from the start point"</b></p> <p><i>Intrinsic Evidence:</i></p> <p>U.S. Patent No. 8,349,239, including but not limited to:</p> <p>The '239 patent states that "as discussed below, computer <b>12</b> also desirably adjusts the start point and/or the stop point of each contour tool path of the layer to one or more locations that are within an interior region of the layer defined by the respective contour tool path." Col. 5, lns. 4-8.</p> <p>The '239 patent further states that "stop point <b>54</b> is a second location in the x-y plane at which extrusion head <b>20</b> is directed to stop depositing the modeling material." Col. 6, lns. 20-23.</p> <p>"This process provides a continuous road of the deposited modeling material at all locations around perimeter path <b>38</b>..." Col. 6, lns. 33-34.</p>

Stratasys's Proposed Construction and Evidence	Afinia's Proposed Construction and Evidence
<p>Stratasys is relying on the expert opinion of Stephen Danforth, Ph.D., attached as Exhibit 1, relating to how and why a person of ordinary skill in the art would have understood “stop point” to mean “point where the contour tool path ends” in claim 1 and to mean “point where the tool path ends” in claim 15 in the context of the '239 patent.</p> <p>Stratasys reserves the right to rely on the claim construction proposed and any statements made by Afinia in the IPR proceedings on the '239 patent (IPR2015-00288).</p>	<p>U.S. Patent 8,349,239 prosecution history, including references cited</p> <p><i>Extrinsic Evidence:</i></p> <p>Afinia identifies Dr. Thomas Campbell, Ph.D. and/or Dr. Thomas Kurfess, Ph.D., as potentially offering expert testimony in rebuttal to Plaintiff's expert opinions.</p>

**12. “step-over arrangement” as used in claims 1 and 17  
(identified for construction by both parties)**

Stratasys's Proposed Construction and Evidence	Afinia's Proposed Construction and Evidence
<p><b>“the intersection where the tool path steps from a perimeter to an interior or from an interior to a perimeter”</b></p> <p><i>Intrinsic Evidence:</i></p> <p>U.S. Patent 8,349,239, including but not limited to:</p> <ul style="list-style-type: none"> <li>-Claim 1</li> <li>-Claim 15</li> <li>-Claim 17</li> <li>-Figure 3</li> <li>-Figure 10</li> </ul>	<p><b>“the junction where the continuing extrusion moves between a perimeter path and an interior path”</b></p> <p><i>Intrinsic Evidence:</i></p> <p>U.S. Patent No. 8,349,239, including but not limited to:</p> <p>The term step-over is not specifically defined in the specification of the '239 Patent. With reference to Figure 15, the specification states:</p>

<b>Stratasys's Proposed Construction and Evidence</b>	<b>Afinia's Proposed Construction and Evidence</b>
<p>-Figure 14 -Figure 15 -3:4-5 -5:8-10 -6:33-7:16 -7:35-40 -10:34-49 -12:15-13:7</p> <p>U.S. Patent 8,349,239 prosecution history, including references cited</p> <p><i>Extrinsic Evidence:</i></p> <p>U.S. Patent Pub. No. 2003/0236588</p> <p>Stratasys is relying on the expert opinion of Stephen Danforth, Ph.D., attached as Exhibit 1, relating to how and why a person of ordinary skill in the art would have understood “step-over arrangement” to mean “the intersection where the tool path steps from a perimeter to an interior or from an interior to a perimeter” in the context of the '239 patent.</p> <p>Stratasys reserves the right to rely on the claim construction proposed and any statements made by Afinia in the IPR proceedings on the '239 patent (IPR2015-00288).</p>	<p>Accordingly, during the build operation, controller 30 directs extrusion head 20 to begin depositing the modeling material at start point 1052, and to move along contour tool path 1040 in the direction of arrows 1044 until reaching point 1092. This substantially forms perimeter path 1038a. At this point, while continuing to deposit the modeling material, extrusion head 20 steps over from perimeter path 1038a to begin forming perimeter path 1038b at point 1094. Extrusion head 20 then continues to moves along contour tool path 1040 in the direction of arrows 1090 until reaching stop point 1054. This forms perimeter path 1038b. As shown, stop point 1054 is adjusted to a location within interior region 1050. As such, seam 1064 also extends inward within interior region 1050. This effectively eliminates the formation of bulges of modeling material at seam 1064. Additionally, the step-over arrangement also reduces the porosity of 3D model 26 at seam 1064, thereby reducing or eliminating the transmission of gases and/or liquids through seam 1064. Col. 12, lns. 17-35.</p> <p>U.S. Patent 8,349,239 prosecution history, including references cited</p> <p><i>Extrinsic Evidence:</i></p> <p>Afinia identifies Dr. Thomas Campbell, Ph.D. and/or Dr. Thomas Kurfess, Ph.D., as potentially offering expert testimony in rebuttal to Plaintiff's expert opinions.</p>

**13. “reduces surface porosity” as used in claim 1  
(identified for construction by Afinia)**

<b>Stratasys’s Proposed Construction and Evidence</b>	<b>Afinia’s Proposed Construction and Evidence</b>
<p><b>“reduces the transmission of gases and/or liquids through the seam”</b></p> <p><i>Intrinsic Evidence:</i></p> <p>U.S. Patent 8,349,239, including but not limited to:</p> <ul style="list-style-type: none"> <li>-Claim 1</li> <li>-6:33-7:44</li> <li>-12:15-8</li> <li>-12:29-35</li> </ul> <p>U.S. Patent 8,349,239 prosecution history, including references cited</p> <p><i>Extrinsic Evidence:</i></p> <p>U.S. Patent Pub. No. 2003/0236588</p> <p>Stratasys is relying on the expert opinion of Stephen Danforth, Ph.D., attached as Exhibit 1, relating to how and why a person of ordinary skill in the art would have understood “reduces surface porosity” to mean “reduces the transmission of gases and/or liquids through the seam” in the context of the ’239 patent.</p> <p>Stratasys reserves the right to rely on the claim construction proposed and any statements made by Afinia in the IPR proceedings on the ’239 patent (IPR2015-00288).</p>	<p><b>“reduces the quality or state of being porous at the surface”</b></p> <p><i>Intrinsic Evidence:</i></p> <p>U.S. Patent No. 8,349,239 and its prosecution history, including references cited</p> <p>Plain and ordinary meaning.</p> <p>Potential extrinsic evidence:</p> <p>Merriam Webster’s dictionary.</p> <p>Definition of <i>POROSITY</i>:</p> <p>1 the quality or state of being porous.</p> <p><i>Further Extrinsic Evidence:</i></p> <p>Afinia identifies Dr. Thomas Campbell, Ph.D. and/or Dr. Thomas Kurfess, Ph.D., as potentially offering expert testimony in rebuttal to Plaintiff’s expert opinions.</p>

**14. “raster path” as used in claim 7  
(identified for construction by Afinia)**

<b>Stratasys’s Proposed Construction and Evidence</b>	<b>Afinia’s Proposed Construction and Evidence</b>
<p><b>“back and forth path”</b></p> <p><i>Intrinsic Evidence:</i></p> <p>U.S. Patent 8,349,239, including but not limited to:</p> <ul style="list-style-type: none"> <li>-Claim 1</li> <li>-Claim 7</li> <li>-Claim 15</li> <li>-Figure 11</li> <li>-Figure 12</li> <li>-2:41-50</li> <li>-5:11-19</li> <li>-6:12-16</li> <li>-8:17-20</li> <li>-10:54-11:4</li> <li>-11:10-18</li> <li>-12:10-14</li> <li>-12:51-56</li> </ul> <p>U.S. Patent 8,349,239 prosecution history, including references cited</p> <p><i>Extrinsic Evidence:</i></p> <p>U.S. Patent Pub. No. 2003/0236588</p> <p>Stratasys is relying on the expert opinion of Stephen Danforth, Ph.D., attached as Exhibit 1, relating to how and why a person of ordinary skill in the art would have understood “raster path” to mean “back and forth path” in the context of the ’239 patent.</p>	<p><b>“a tool path that is used to fill a portion of an interior region defined by a perimeter”</b></p> <p><i>Intrinsic Evidence:</i></p> <p>U.S. Patent No. 8,349,239, including but not limited to:</p> <p>As noted in the specification of the ‘239 Patent, “based on each generated contour tool path, computer 12 may then generate one or more additional tool paths (e.g., raster paths) to fill in the interior region(s) defined by the perimeter(s), as necessary. Col. 5, lns. 11-14.</p> <p>U.S. Patent 8,349,239 prosecution history, including references cited</p> <p>Extrinsic evidence as to the course of the raster path not being back and forth [as proposed by Plaintiff]:</p> <p>J. Kao, “Process Planning for Additive/Subtractive Solid Freeform Fabrication Using Medial Axis Transform,” A Stanford University Dissertation, June 1999.</p> <p>Kulkarni, <i>et al.</i>, “Deposition Strategies and Resulting Part Stiffnesses in Fused Deposition Modeling, Journal of Manufacturing Science and Engineering, February 1999, Vol. 121, pp. 93-103.</p>

<b>Stratasys's Proposed Construction and Evidence</b>	<b>Afinia's Proposed Construction and Evidence</b>
<p>Stratasys reserves the right to rely on the claim construction proposed and any statements made by Afinia in the IPR proceedings on the '239 patent (IPR2015-00288).</p>	<p>Ruan, <i>et al.</i>, "2-D Deposition Pattern and Strategy Study on Rapid Manufacturing," Proceedings of IDETC/CIE 2006, Paper No. DETC2006-99326, ASME 2006 International Design Engineering Technical Conferences &amp; Computers and Information in Engineering Conference, Philadelphia, Pennsylvania, USA, September 10-13, 2006, pp. 967-973</p> <p>U.S. Patent No. 6,859,681 to Alexander.</p> <p>U.S. Patent Application Publication No. U.S. 2003/0236588 to Jang, <i>et al.</i></p> <p><i>Further Extrinsic Evidence:</i></p> <p>Afinia identifies Dr. Thomas Campbell, Ph.D. and/or Dr. Thomas Kurfess, Ph.D., as potentially offering expert testimony in rebuttal to Plaintiff's expert opinions.</p>



**15. “tool path” as used in claim 15  
(identified for construction by Afinia)**

<b>Stratasys’s Proposed Construction and Evidence</b>	<b>Afinia’s Proposed Construction and Evidence</b>
<p><b>“path of the extrusion head for a layer of a three-dimensional object”</b></p> <p><i>Intrinsic Evidence:</i></p> <p>U.S. Patent 8,349,239, including but not limited to:</p> <ul style="list-style-type: none"> <li>-Claim 15</li> <li>-1:30-33</li> <li>-5:11-19</li> <li>-6:12-16</li> <li>-8:32-35</li> <li>-9:6-15</li> <li>-10:8-18</li> <li>-10:23-28</li> <li>-10:32-35</li> </ul> <p>U.S. Patent 8,349,239 prosecution history, including references cited</p> <p><i>Extrinsic Evidence:</i></p> <p>U.S. Patent Pub. No. 2003/0236588</p> <p>Stratasys is relying on the expert opinion of Stephen Danforth, Ph.D., attached as Exhibit 1, relating to how and why a person of ordinary skill in the art would have understood “tool path” to mean “path of the extrusion head for a layer of a three-dimensional object” in the context of the ’239 patent.</p> <p>Stratasys reserves the right to rely on the claim construction proposed and any</p>	<p><b>“a set of one or more computer-generated instructions for the extrusion head to follow”</b></p> <p><i>Intrinsic Evidence:</i></p> <p>U.S. Patent No. 8,349,239, including but not limited to:</p> <p>For each layer, computer <b>12</b> may then generate one or more tool paths for extrusion head <b>20</b> to follow for building each layer of 3D model <b>26</b> and support structure <b>28</b>. Col 4, ln. 65 – Col. 5, ln. 1.</p> <p>The generated data may also be transmitted from computer <b>12</b> to controller <b>30</b> for building 3D model <b>26</b> and support structure <b>28</b>. Col. 5, lns. 25-27.</p> <p>U.S. Patent 8,349,239 prosecution history, including references cited</p> <p><i>Extrinsic Evidence:</i></p> <p>Afinia identifies Dr. Thomas Campbell, Ph.D. and/or Dr. Thomas Kurfess, Ph.D., as potentially offering expert testimony in rebuttal to Plaintiff’s expert opinions.</p>

Stratasys's Proposed Construction and Evidence	Afinia's Proposed Construction and Evidence
statements made by Afinia in the IPR proceedings on the '239 patent (IPR2015-00288).	

**16. "perimeter of a layer" as used in claim 15  
(identified for construction by Afinia)**

Stratasys's Proposed Construction and Evidence	Afinia's Proposed Construction and Evidence
<p><b>Plain and ordinary meaning.</b></p> <p>If this term needs construction, Stratasys's proposed construction is:</p> <p><b>"road of modeling material that defines an interior region"</b></p> <p><i>Intrinsic Evidence:</i></p> <p>U.S. Patent 8,349,239, including but not limited to:</p> <ul style="list-style-type: none"> <li>-Claim 15</li> <li>-Abstract</li> <li>-Figure 2</li> <li>-1:16-19</li> <li>-1:30-33</li> <li>-1:63-2:2</li> <li>-2:5-11</li> <li>-5:11-19</li> <li>-5:54-63</li> <li>-6:5-16</li> <li>-6:29-37</li> </ul> <p>U.S. Patent 8,349,239 prosecution history, including references cited</p>	<p><b>"a contour or portion of a contour of a feature of the object"</b></p> <p><i>Intrinsic Evidence:</i></p> <p>U.S. Patent No. 8,349,239 and its prosecution history including references cited</p> <p><i>Extrinsic Evidence</i> as to whether an internal feature may include a contour:</p> <p>J. Kao, "Process Planning for Additive/Subtractive Solid Freeform Fabrication Using Medial Axis Transform," A Stanford University Dissertation, June 1999.</p> <p>Kulkarni, <i>et al.</i>, "Deposition Strategies and Resulting Part Stiffnesses in Fused Deposition Modeling, Journal of Manufacturing Science and Engineering, February 1999, Vol. 121, pp. 93-103.</p> <p>Ruan, <i>et al.</i>, "2-D Deposition Pattern and Strategy Study on Rapid Manufacturing,"</p>

<b>Stratasys's Proposed Construction and Evidence</b>	<b>Afinia's Proposed Construction and Evidence</b>
<p><i>Extrinsic Evidence:</i></p> <p>U.S. Patent Pub. No. 2003/0236588</p> <p>Stratasys is relying on the expert opinion of Stephen Danforth, Ph.D., attached as Exhibit 1, relating to how and why a person of ordinary skill in the art would have understood “perimeter of a layer” to have its plain and ordinary meaning or to mean “road of modeling material that defines an interior region” in the context of the '239 patent.</p> <p>Stratasys reserves the right to rely on the claim construction proposed and any statements made by Afinia in the IPR proceedings on the '239 patent (IPR2015-00288).</p>	<p>Proceedings of IDETC/CIE 2006, Paper No. DETC2006-99326, ASME 2006 International Design Engineering Technical Conferences &amp; Computers and Information in Engineering Conference, Philadelphia, Pennsylvania, USA, September 10-13, 2006, pp. 967-973.</p> <p>U.S. Patent No. 6,859,681 to Alexander.</p> <p>U.S. Patent Application Publication No. U.S. 2003/0236588 to Jang, <i>et al.</i></p> <p><i>Further Extrinsic Evidence:</i></p> <p>Afinia identifies Dr. Thomas Campbell, Ph.D. and/or Dr. Thomas Kurfess, Ph.D., as potentially offering expert testimony in rebuttal to Plaintiff's expert opinions.</p>

Dated: December 19, 2014

*s/ Timothy E. Grimsrud*

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